CLAIMS

We claim:

1. A tensioner comprising:

a housing having a plunger-receiving hole, said hole
     having a front end, an opening at said front end,
     a plunger-receiving part having a first diameter,
     and   a widened part adjacent said front end,
     said widened part having a diameter wider than
     said first diameter and a shoulder recessed from
     said front end and facing toward said front end;

a plunger having a longitudinal axis and slidably
     fitting into said plunger-receiving hole and
     protruding axially from the opening thereof in a
     protruding direction, said plunger having an
     external surface with longitudinally extending,
     toothed racks formed thereon;

a protrusion biasing spring, biasing said plunger in
     said protruding direction;

a cam-receiving ring, through which the plunger
     extends, the cam-receiving ring being located in
     said widened part of the hole, and having an
     oblique cam-guiding surface, said guiding surface
     sloping in the direction of protrusion of the
     plunger and outward from the axis of the plunger;

a ring-biasing spring, biasing said cam-receiving ring
     in the direction of protrusion of the plunger;

a plurality of wedge-shaped cams, which slide on the
     oblique cam-guiding surface of the cam-receiving

ring, and engageable with the racks on said
plunger;

a cam-biasing spring, biasing said wedge-shaped cams
in the direction opposite to said direction of
protrusion of the plunger; and

a seal cap on said housing, the seal cap having a cap
opening through which the plunger extends axially,
and cooperating with said widened portion of said
hole to provide an enclosure containing said
ring-biasing spring, said cam-receiving ring,
said wedge-shaped cams, and said cam biasing
spring, said seal cap having an inside end
surface surrounding said cap opening;

wherein said cam-receiving ring is disposed between
said inside end surface of said seal cap and said
shoulder, and movable axially therebetween.

2.   A chain tensioner according to claim 1, in which
when the minimum backlash distance of said plunger is
defined as M, the maximum backlash distance of said plunger
is defined as N, the maximum displacement of said cam-
receiving ring is defined as S, the return distance of the
plunger due to displacement of said cams from a position
immediately preceding the position at which said cams step
over one tooth of the racks is defined as n, and the return
distance of the plunger due to displacement of said cams
from a position immediate following the position at which
said cams step over one tooth of the racks is defined as m,
the dimensions of the racks of the plunger, the wedge-

shaped cams, and the cam-receiving ring satisfy the relationships $M = m + S$ and $N = n + S$.